

Claims

1. An electronic device for a mask container that is
adopted to carry a lithography mask,
5 said electronic device comprising:
a receiver unit to receive first data;
a memory unit to temporarily store said first data;
a processor unit to process said first data and to
provide second data; and
10 a transmitter unit to transmit said second data.

2. The electronic device of claim 1, wherein said mask
container carries said lithography mask between a
first station and a second station, said first station
15 using said lithography mask in a first process, said
second station at a later time-point using said
lithography mask in a second process, said first data
being indicative on how said first station has used
said lithography mask in said first process, and said
20 second data being indicative on how said second
station uses said lithography mask in said second
process.

3. The electronic device of claim 2, wherein said
25 transmitter unit transmits said second data to said
second station before said second station uses said
lithography mask in said second process.

4. The electronic device of claim 3, wherein said
30 processor unit processes said first data by combining
said first data with an instruction.

5. The electronic device of claim 4, wherein said instruction is indicative on how said lithography mask is used in said second process.

5 6. The electronic device of claim 4, wherein said receiver unit also receives said instruction.

10 7. The electronic device of claim 6, wherein said receiver unit receives said first data at a first time point and receives said instruction at a second time point that comes later.

8. The electronic device of claim 2, wherein using said lithography mask in any of said first and second processes comprises at least one of the following:

- inserting said lithography mask into said container;
- 5 • removing said lithography mask from said container;
- in combination, inserting and removing multiple lithography masks to and from said container;
- writing data to said lithography mask;
- 10 • reading data from said lithography mask;
- exposing a semiconductor wafer by sending electromagnetic radiation through said lithography mask;
- storing said lithography mask;
- 15 • transporting said lithography mask from one location to another location;
- manufacturing said lithography mask;
- maintaining said lithography mask;
- 20 • modifying said lithography mask by changing exposure properties;
- damaging said lithography mask, disposing of said lithography mask, recycling said lithography mask;
- testing and measuring the properties of said lithography mask;
- assigning an identifier for said lithography mask;
- 25 • assigning an identifier for a plurality of lithography masks; and
- transferring information that relates to said lithography mask from a first electronic device in a first container to a further electronic device in a further container.

Sub 3

9. The electronic device of claim 1, wherein said receiver unit, said memory unit, said processor unit, and said transmitter unit are coupled by a bus.

5 10. The electronic device of claim 1, wherein said receiver unit and said transmitter unit are implemented as a transceiver unit.

10 11. The electronic device of claim 10, wherein said transceiver unit is a wireless transceiver.

12. The electronic device of claim 11, wherein said wireless transceiver is a radio frequency transceiver.

15 13. The electronic device of claim 11, wherein said wireless transceiver is an infra-red transceiver.

14. The electronic device of claim 1, wherein said memory unit is a non-volatile memory.

20 15. The electronic device of claim 14, wherein said non-volatile memory is an EEPROM.

16. The electronic device of claim 14, wherein said non-volatile memory is an SRAM.

25 17. The electronic device of claim 1 comprising a power supply that is implemented by at least a component of the following group: battery, photovoltaic element, thermal converter, and inductive power converter.

18. The electronic device of claim 1 that is permanently attached to said mask container by an adhesive.

5/24/07
SJB

19. The electronic device of claim 1, wherein said processor unit and said memory unit are implemented on a single monolithic chip.

5 20. The electronic device of claim 1, wherein said transceiver communicates with a further electronic device at a further lithography mask container and with further stations.

10 21. The electronic device of claim 1, wherein for a further lithography mask carried in said mask container said second data is indicative on how a third station uses said further lithography mask a third process.

15 22. A method for operating a manufacturing system for semiconductor wafers, said manufacturing system employing a plurality of lithography masks that are carried in a plurality of mask containers, said method comprising the following steps:

20 exchanging data relating to a predetermined process between an electronic device attached to the mask container and a host computer system; and using a lithography mask in a station in said

25 predetermined process, wherein using comprises at least one step out of the group of the following steps:

- inserting said lithography mask into said container;
- removing said lithography mask from said container;
- in combination, inserting and removing multiple lithography masks to and from said container;
- writing data to said lithography mask;
- reading data from said lithography mask;

30

- exposing a semiconductor wafer by sending electromagnetic radiation through said lithography mask;
- storing said lithography mask;
- 5 • transporting said lithography mask from one location to another location;
- 7 • manufacturing said lithography mask;
- maintaining said lithography mask;
- modifying said lithography mask by changing exposure properties;
- 10 • damaging said lithography mask, disposing of said lithography mask, recycling said lithography mask;
- testing and measuring the properties of said lithography mask;
- 15 • assigning an identifier for said lithography mask;
- assigning an identifier for a plurality of lithography masks; and
- transferring information that relates to said lithography mask from a first electronic device in a first container to a further electronic device in a further container.
- 20
- 23. The method of claim 22 wherein said step ¹_A exchanging data comprises receiving data by said electronic device, transmitting data from said electronic device, and processing data by said electronic device.
- 25

24. A method to operate a wafer manufacturing system that uses a lithography mask container having an electronic device attached thereto, said lithography mask container to carry a mask from a first station to a second station, said method comprising the following steps:

5 by said first station, applying a first process using said mask;

10 by said first station, sending 302 first data that indicates quality and quantity of said first process from said first station to said electronic device and, by said electronic device, receiving said first data;

15 by said electronic device, based on said first data, processing an instruction that indicates expected quality and quantity of a second process to provide second data that determines final quality and quantity of said second process;

20 by said electronic device, transmitting said second data to said second station; and

by said second station, applying said second process using said mask.

TOP SECRET//NOFORN

5
J
S
B